EXPERIMENTS

IN Syn. 8. 67. 3

CONSORT

OF THE

LUCTATION

ARISING

From the Affusion of several

MENSTRUUMS

Upon all sorts of

BODIES,

Exhibited to the Royal Society, *April* 13. and *June* 1. 1676.

By *NEHEMIAH GREW*, M. D. and Fellow of the *Royal Society*.

LONDON,
Printed for *John Martyn*, Printer to the *Royal Society*, at the *Bell* in S. *Pauls* Church-yard. 1678.

Thursday, Novemb. 15. 1677.

At a Meeting of the Council of the Royal Society

Ordered,

That a Book, entituled *Experiments in Consort of the Luctation arising from the Affusion of several Menstruum's upon all kinds of Bodies, exhibited to the Royal Society,* April 13. *and* June 1. 1676. *by* Nehemiah Grew, *M. D. Fellow of the R. S.* be printed by *John Martyn,* Printer to the said Society.

Thomas Henshaw
Vicepræses S. R.

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88; 120

TO THE

MOST ILLUSTRIOUS

THE

ROYAL SOCIETY,

THE FOLLOWING

EXPERIMENTS

ARE MOST HUMBLY

PRESENTED

BY THE

AUTHOR

NEHEMIAH GREW.

THE PREFACE.

THE *intent of the following* Experiments *is twofold. The one, To be as a* Demonſtration *of the Truth of one, amongſt other* Propoſitions, *laid down in my Diſcourſe of* Mixture, *ſc.* That it would be a Key

to let us eaſily into the knowledge of the Nature of Bodies.

The other, and that conſequently, To be as a Specimen of a Natural Hiſtory of the Materia Medica: *that is to ſay, a multifarious Scrutiny into the intrinſick Properties of all thoſe Materials, which have been, or may be uſed in* Medicine: *for the performance whereof, the following* Method *is exhibited as one, amongſt others, neceſſary to be inſiſted upon.*

on. For what Dominion a Prince *hath over the* Moral, *that a* Phyſician *hath, as one of God Almighty's* Vice-Roys, *over the* Corporeal *World. Whome therefore nothing can more import, than a particular knowledge of the* Genius *of all his* Subjects, *thoſe ſeveral* Tribes *of* Matter, *ſuppoſed to be under his Command.*

The Experiments *may ſeem too numerous to be of one* make. *But no leſs a number would have anſwered*

swered the design of an Universal Survey; *which, though less pleasing, proves the more instructive in the end: not being like angling with a single* Hook; *but like casting a* Net *against a shole; with assurance of drawing up something. Besides the advantage of* comparing many together; *which being thus joyned, do oftentimes, like* Figures, *signifie ten times more, than standing alone, they would have done.*

How

How far the Corollaries *all along ſubjoyned have made this good, is left to the* Reader *to judge. And alſo, to add to them, ſo many more, as he pleaſes; for I make my own thoughts no mans* Meaſure. *Thoſe I have ſet down, if compared, will, I preſume, appear eaſie and natural; which is all I ſhall ſay for them. Let them go and take their fortune without a* Flambeau; *which being prefixed to things of ſo glimmering*

mering a ſhew, would not ſerve to blazon, but extinguiſh them.

EXPERI-

EXPERIMENTS IN CONSORT OF THE LUCTATION

Arising upon the Mixture of Bodies.

CHAP. I.

ALthough there are some known *Observations* of this nature;

yet there is no *Author*, I think, who hath given us *a Syſteme of Experiments in conſort upon the Subject:* the performance whereof, therefore, is here intended.

The Bodies whereupon I made tryal, were of all kinds, *Animal*, *Vegetable*, and *Mineral*. Amongſt *Vegetables*, ſuch as theſe, *ſcil. Date-ſtones*, *Ginger*, *Colocynthis*, *Pyrethrum*, *Hawthorn-ſtones*, *Staphiſagria*, *Euphorbium*, the *Arenulæ* in Pears, *Semen Milii*

Milii Solis, *Tartar*, *Spirit* of *Scurvygraſs*, *Spirit* of *Wine*, &c.

Amongſt *Minerals*, ſeveral ſorts of *Earths*, *Stones*, *Ores*, *Metals*, *Sulphurs*, and *Salts*.

Amongſt *Animals*; ſuch as theſe, *ſcil. Hairs*, *Hoofs*, *Horns*, *Shells* and *ſhelly Inſects*, *Bones*, *Fleſh*, and the ſeveral *Viſcera*, *Silk*, *Blood*, *Whites* and *Yolks* of Eggs, *Sperma Ceti*, *Civet*, *Musk*, *Caſtor*, *Gall*, *Urine*, *Dungs*, *animal Salts* and *Stones*.

The *Liquors* which I poured hereupon ſeverally, were theſe, *ſcil. Spirit* of *Salt Armoniac*, *Sp.* of *Harts-Horn*, *Sp.* of *Nitre*, *Aq. fortis*, *Oil* of *Salt*, *Oil* of *Sulphur*, and *Oil* of *Vitriol*.

In the mixture of theſe Bodies, two things, in general, are all along to be obſerved, *viz.*

Firſt, which they are, that make *any*, or *no Luctation*. For, as ſome which ſeem to promiſe it, make none: ſo, many, con-

contrary to expectation, make a conſiderable one.

Next, the *manner* wherein the *Luctation* is made; being with much variety in theſe *five* ſenſible *effects*.

1. *Bullition*; when the Bodies mixed produce only a certain quantity of froth or bubbles.

2. *Elevation*; when, like Paſte in baking, or Barm in the working of Beer, they ſwell and huff up.

3. *Crepitation*; when

they make a kind of hiſſing and ſometimes a crackling noiſe.

4. *Effervescence*; then only and properly ſo called, when they produce ſome degree of heat.

5. *Exhalation*; when not only fumes, but viſible ſteams are produced.

Of all theſe, ſometimes one only happens, ſometimes two or more are concomitant. Sometimes the *Luctation* begins preſently upon mixture, and ſometimes not till

till after ſome intermiſſion. In ſome bodies, it continues a great while; in others, is almoſt inſtantaneous: Examples of all which I ſhall now produce; beginning with *Vegetables*, as affording the leaſt variety.

And firſt, if we take Spirit or Oil of Salt, Oil of Vitriol, Spirit of Nitre, or Aq. fortis, and pour them ſeverally upon the ſeveral parts of Vegetables, as Roots, Woods, Stones, &c. we ſhall find, that they are,

generally far leſs apt to make a Luctation, than either Animal, or ſubterraneal Bodies.

Whence, as from one argument, it ſeemeth evident, That in moſt *Vegetables*, and in moſt of their parts, the predominant *Salt* is an *Acid*. But that, on the contrary, the predominant *Salt* in moſt *Minerals*, and parts of *Animals*, is an *Alkaly*: in the former, uſually a *fixed*; in the latter, a *volatile Alkaly*.

Again,

Again, although the *Luctation which moſt Vegetables, and moſt of their parts make with Acids, be but ſmall, yet ſome they make; eſpecially with ſome Acids, as with Spirit of Nitre and Aqua fortis.*

Whence it ſeemeth plain, That there is an *Alkalizate Salt* exiſtent in many *Vegetables*, even in their *natural eſtate*; and that it is not made *Alkalizate*, but only *Lixivial*, by the *fire*. Or, there is ſome quantity of a *Salt*,

call it what we will, in the ſaid Bodies, which is ſo far different from, as to make a *Luctation* with an *Acid*. But to give particular inſtances of the ſeveral *proportions* wherein it appears to be in ſeveral *Vegetables*.

And firſt, of all vegetable Bodies, Date-ſtones are amongſt the leaſt apt to make a Luctation with Acids, if they may be ſaid to make any at all.

Hence they are not ſo potent *Nephriticks*, as many

ny other Stones, which make a more ſenſible *Luctation.*

Ginger makes a ſmall Bullition with Aq. fortis, only obſervable by a Glaſs.

Hence the *pungency* of Ginger lyeth in a *ſulphureous* and *volatile Salt*, which yet is very little *Alkalizate.*

Scurvygraſs-ſeed makes a very ſmall Bullition with Aq. fortis, like that of Ginger. So doth alſo the ſeed of Purſlane.

Hence, although there

is much more of a certain kind of *volatile Salt* in Ginger or Scurvygraſs, than in Purſlane; yet there is as much of an *Alkaly* in any one, as the others.

Colocynthis, Fruit-ſtones, the ſtony Covers of the ſeeds of Elder, white Bryony, Violets, and others, with Aq. fortis make a Bullition juſt perceivable without a Glaſs.

Hence it appears, That the great *Cathartick* power of *Colocynthis* lyeth not in

in an *Alkaly*, but an *Acid*; as making a much leſs *Bullition*, than ſome other vegetable Bodies, which are leſs *Cathartick*. For which reaſon likewiſe it is, That the beſt Correctors, or Refractors of the force of *Colocynthis*, are ſome kinds of *Alkalies*, as particularly that of *Urine*, as *Riverius* hath ſomewhere obſerved.

The Root of Pyrethrum, with Aq. fortis, makes a Bullition and huff, in a ſhort time.

Hence,

Hence, the Cauſe of a *durable Heat*, upon the Tongue, is an *Alkalizate Sulphur*. For the Heat of Ginger, though *greater*; yet abideth *nothing near ſo long* as that of Pellitory or *Pyrethrum*; which, as is ſaid, maketh alſo a more ſenſible *Bullition* with *Acids*.

Kermes-berries, commonly, but ignorantly, ſo called, with the ſaid Liquor, huff up to an equal height, but in a ſomewhat longer time.

Hence

Hence they are gently *aſtringent*; *ſcil.* as their *Alkaly* binds in with ſome preternatural *Acid* in the ſtomach.

Hawthorn-ſtones, with Aq. fortis, huff up equally with the former Body; but the Bullition is not ſo viſible. The like is alſo obſervable of Medlar-ſtones.

Hence, as they contain a middle quantity of an *Alkaly*, they are not inſignificantly uſed againſt the *Stone*.

Seeds of Staphiſagria,

with

with Aqua fortis, make a Bullition ſtill more viſible. But it quickly ends.

This confirms what was ſaid before, *ſc.* That the cauſe of a *durable Heat* is an *Alkalizate Sulphur*; theſe Seeds producing a *durable Heat*, as doth the Root of *Pyrethrum*.

The ſeeds alſo of red Roſes, Borage, and Comfrey do all with Aq. fortis make a conſiderable Bullition and huff; and that very quickly.

So that amongſt all Shells

Shells and Stones, thoſe generally make the greateſt *Bullition*, which are the hardeſt and the brittleſt.

Euphorbium makes a Bullition yet more conſiderable, with much froth, and very quickly.

From which Experiment, compared with two of the former, it appears, That *Euphorbium* is not an *acid*, but an *alkalizate Gum*. As alſo, that the cauſe of its ſo very *durable Heat*, is an *alkalizate Sul-*

Sulphur, as of *Pyrethrum* and *Staphiſagria* hath been ſaid.

It ſeems alſo hence evident, that the power of all great *Sternutatories* lyeth not in their *Acid*, but their *Alkalies*.

The Arenulæ or little ſtones in Pears, cluſter'd round about the Coar, with Aq. fortis, preſently huff up, and make a great Bullition and Effervеſcence, much greater than do any of the Bodies above-named.

Whence

Whence, although, ſo far as I know, they have never yet been uſed in *Medicine*; yet is it probable, that they are a more potent and effectual *Nephritick*, than any of the Bodies aforeſaid, and ſome of them uſually preſcribed.

It is hence alſo manifeſt, That, according to what I have elſewhere *ſaid, for the ſweetening of the Fruit and Seed, the *tartareous* and *alka-*

**First Book of the Anatomy of Plants.*

alkalizate parts of the *Sap* are *precipitated* into their *ſtones*, *ſtony parts*, and *ſhells*.

The laſt Inſtance ſhall be in the ſhells of the ſeeds of Milium Solis; which not only with Aq. fortis but ſome other Acids, make a greater and quicker Bullition and Effervеſcence, than any other vegetable Body, upon which I have yet made tryal, in its natural eſtate.

Hence, as well as from divers of the laſt fore-going

ng Inſtances, we have a lear confirmation of what I have, towards the beginning of this Diſcourſe, aſſerted; *ſc.* That here is an *alkalizate Salt* exiſtent in *Plants*, even in their *natural eſtate.* As alſo, that they are as ſignificantly uſed againſt the Stone, *quatenus alkalizate*, as *Millepedes*, *Egg-ſhells*, or any other *teſtaceous Bodies* of the ſame ſtrength.

To theſe I ſhall ſubjoyn one or two Examples

ples of Vegetable Bodi
which are more or le
alter'd from their *natur*
eſtate.

Neither Cryſtals of Tar
tar, nor Tartar it ſelf (al
though they have ſom
ſtore of alkalizate mixe
with their acid parts
make any Efferveſcenc
with Acids, but only with
Alkalies, as Spirit of Harts
Horn, &c.

Hence the *calculous ſe-*
diment of *Urine*, not ſo
properly called the *Tar-*
tareous part of the *Urine*;
from

from the quite contrary events following its mixture with the aforesaid *Salts*; as will be seen hereafter.

Spirit of Scurvygrass maketh no Luctation with any acid.

Hence (as from the former Experiment was above-noted) it seems, That there may be a kind of *volatile Salt*, which is neither *acid*, nor *alkalizate*; such as this of *Scurvygrass* and other like *Plants* seems to be: *scil.* such

ſuch a *Salt* as is not properly *alkalizate*, and yet contrary to an *acid*; as experience ſhews in its efficacy againſt the *acid Scurvy*.

Rectified Spirit of Wine, both with Spirit of Nitre, and with Oil of Vitriol, ſeverally, maketh a little Luctation.

Which argues, that there is contained, even in this Spirit, ſome portion of a *volatile Alkaly*.

Spirit of Wine, and double Aqua fortis, as the ſtrong-

ſtrongeſt is called, make an effervescence ſo vehement, as plainly to boil.

Beſides the vehemence hereof, there is another ſurprizing circumſtance. For whereas all other Liquors which make an Effervescence together, will do it in any quantity aſſigned to either of them, although but one drop to a thouſand: on the contrary, theſe two, ſc. rectified Spirit of Wine and Aqua fortis, require a certain proportion the one to the other. For if into

no more than ſix drops of Spirit of Wine you put in but two or three of Aq. fortis, they ſtir no more than if you put in ſo much Water: but drop in about ſeven or eight drops of Aq. fortis, and they preſently boil up with very great vehemency.

Hence we may conceive the reaſon of the ſo very ſudden acceſs of an *acute Diſeaſe*, and of its *Criſis*. Theſe not beginning *gradually with the Cauſe*; but then, when the

the *Cauſe* is arrived unto ſuch an ἀκμὴ, or ſuch a certain *Proportion*, as is neceſſary to bring Nature to the conteſt. And theſe may ſerve for Examples upon *Vegetables*.

CHAP. II.

HAving given ſeveral Inſtances of tryal upon *Vegetables*; I next proceed to *Minerals*, which, for ſome orders

ſake, I ſhall diſtribute into five or ſix ſorts, *ſc. Earths, Stones, Ores* and *Metals, Sulphurs*, and *Salts.*

Firſt for Earths. Oil of Vitr. upon Fullers Earth, doth not ſtir it, or cauſe the leaſt Bullition. Nor upon yellow Oker. Nor upon the Oker which falls from green Vitriol. The ſame Oil of Vitr. and Spir. of H. Horn poured ſeverally upon Bolus Armena of two kinds, and upon one kind of Terra ſigillata, ſtir none of them. Hence

Hence *Bolus*'s are the *Beds*, or as it were, the *Materia prima*, both of opacous *Stones* and *Metals*; into which the ſaid *Bolus*'s are tranſmuted, by being *concentred* with divers kinds of *Salts* and *Sulphurs*, which ſucceſſively flow in upon them.

Aqua fortis, and Oil of Vitr. being poured ſeverally upon another ſealed Earth, which was vended by the name of Terra Lemnia; they both made a very conſiderable Efferve-

ſcence herewith.

Whence it appears, That there is no ſmall difference in the nature, and therefore the operation of *Bolus Armena* and *Terra Lemnia*. As alſo, betwixt the ſealed Earths themſelves, one making a great *Effervеſcence*, another none at all. Whereto, thoſe that uſe them, are to have regard.

Next for Stones. And firſt Spir. of Nitre upon Tripoly, ſtirreth it not in the leaſt.

Iriſh

Iriſh Slate, with Spirit of Harts-horn, maketh a ſmall, yet viſible Bullition: and it preſently ceaſeth. So that it ſeems to be nothing elſe but a *Vitriolick Bole.* As is alſo argued from its taſte, which is plainly acid, and ſomewhat rough.

Whence alſo it is with good reaſon given upon any inward Bruiſes. Becauſe by coagulating the Blood, it prohibits its too copious afflux into the affected part. Yet being

but gently aſtringent, and ſo the Coagulations it makes, not great; they are likewiſe well enough carried off from the ſame part in the Circulation; by both which means an Inflammation may be either prevented, or the better over-ruled.

Lapis Hæmatites maketh no Effervеſcence at all either with Alkalies or Acids.

Powder of the green part of a Magnet with Oil of Vitriol maketh ſome few bub-

, and *bubbles, yet not visible*
s it *without a Glass.*
they *But the powder of the*
ough *black part of a Magnet,*
ame *which is the said stone ful-*
on ; *ly perfect, stirreth not with*
s an *any acid. Neither doth the*
ei- *calcined Magnet.*
the Hence there is some
considerable difference
ma- betwixt *Iron* and the *Ma-*
at *gnet.*
or *Lapis Lazuli, with Oil*
of Vitriol, and especially
art *with Spirit of Nitre, ma-*
of *keth a conspicuous Bulli-*
ew *tion.*
ub-

Hence its *Cathartick* virtue lyeth in an *Alkaly*. For which reaſon it is alſo appropriate, in like manner as *Steel*, to the cure of *Hypochondriacal Affections*; originated from ſome kind of fermenting Acid.

Oſteocolla, with Spirit of Nitre maketh yet a greater Effervescence.

How it comes to be ſo great a knitter of broken bones, as it is reputed, is obſcure. It ſeemeth, that upon its ſolution

tion by a *Nitrous acid* in the body; it is *precipitated* upon the broken part, and ſo becomes a kind of *Cement* thereto.

Lapis Tuthiæ, with Spirit of Nitre, maketh an Effervescence much alike. And with Oil of Vitriol very conſiderably.

But Lapis Calaminaris with Oil of Vitriol grows ſtark; as the powder of Alabaſter doth with water. With ſpirit of Nitre it maketh a little Bullition, and quickly. But with Aq. fortis,

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tis, a great one; beyond any of the ſtones above-named.

Hence both *Tutty* and *Calamy* are *Ophthalmicks* from their *Alkaly*. Which is alſo confirmed, from the efficacy of ſome *Alkalies* of the like uſe.

Hence alſo *Calamy* ſeemeth to partake ſomewhat of the nature of *Silver*: as by tryal made upon that alſo, will hereafter better appear.

Chalk and Oil of Sulphur or Vitriol make as

ſtrong

ſtrong an Efferveſcence as any of the reſt.

Whence it is ſometimes well uſed againſt a Cardialgia.

Whiting makes as great an Efferveſcence as Chalk. So that it ſeems the ſaline parts are not waſhed away with the water, wherein the Chalk, for the making of Whiting, is diſſolved.

Talk will not ſtir in the leaſt, either with ſpirit of Nitre, or Oil of Vitriol.

But that which is called

the

the Lead-Spar maketh a conſiderable Effervеſcence with both of them ſeverally.

Hence, however this be called *Engliſh Talk*, yet there is no ſmall difference betwixt this and true *Talk*.

To theſe ſtones may be added petrified bodies. As petrified wood; which (that upon which I made tryal) no acid ſtirreth in the leaſt.

Petrified ſhells; upon four or five ſeveral ſorts whereof Oil of Vitriol being

ing poured, produceth a great Effervescence.

The Root or rougher part of the Stone called Glossopetra, *with spirit of Nitre, maketh a conspicuous Bullition.*

Asteria, *the Stone so called, and found in some places in* England, *with Oil of Vitriol, maketh an Effervescence at the same degree. So doth the Belemnites, or Thunder-stone, both the larger and the lesser kinds.*

So that none of these

are

are *acid*, or *vitriolick*, but *alkalizate* Stones.

Coralline, with Oil of Vitriol, makes a conſpicuous Bullition, yet mild and gentle; that is, with very little, if any heat, and without any viſible Fumes. And red and white Coral do the like.

Hence they are all of a very gentle operation, and fit for Children, as the caſe requires.

Magiſtery of Coral (prepared the ordinary way) ſtirreth not in the leaſt, either

ther with Alkalies or Acids.

Whence it is evident, That its active Principles are in its preparation deſtroyed and waſhed away: that is to ſay, It is an elaborate Medicine good for nothing. And thus far of Stones.

I next come to Metals and Ores. And firſt for Lead; upon which ſpirit of Salt, ſpirit of Nitre, or Aq. fortis being dropped, it ſtirreth not in the leaſt with any of them: but with Oil

Oil of Sulphur, and eſpecially with Oyl of Vitriol it maketh a ſlow Bullition and froth.

Hence it ſeemeth to be *the moſt alkalizate Metal.* Which is alſo confirmed by a foregoing Experiment upon the *Lead-Spar*, which maketh a conſiderable Effervescence with any ſort of *acid.* And which likewiſe, being calcined, yieldeth a good quantity of *Lixivial* Salt.

Lead-Ore ſtirreth not at

all

all with Aq. fortis or Oil of Vitriol. But ſpirit of Salt makes it bubble, and ſpirit of Nitre makes it boil.

Hence there is a conſiderable difference betwixt the perfect Metal and the Ore.

Burnt Lead and red Lead, make a very ſmall Bullition with Oil of Vitriol, with ſpirit of Nitre a far greater.

Mercury, with Oil of Vitriol, will not ſtir, nor with Oil of Sulphur. But with ſpirit of Nitre preſently boils up. Hence

Hence *Mercury* is a *ſubacid Metal*; *ſpirit* of *Nitre* being a *ſubalkalizate* Acid.

The filings of Iron or Steel, with Oil of Vitriol, make a fair Bullition, like that of Minium. But ſpirit of Nitre makes them boil with much celerity.

Hence Iron is likewiſe a *ſubacid Metal.*

Steel prepared with Sulphur maketh a far leſs Efferveſcence with the ſame ſpirit of Nitre, than do the filings.

Hence

Hence there is a great difference in their ſtrength. So that ten grains of the filings unprepared, will go as far as fifteen grains or more of thoſe which are prepared, as above-ſaid. Yet in ſome caſes the weaker and milder may be the better.

There is one circumſtance in the mixture of Steel and Aq. fortis, which is ſurrizing; and that is this, that ſtrong Aqua fortis, dropped upon Steel, will not,

not, of it ſelf, make th
leaſt Bullition: but if here
to you only add a drop o
two of Water, they preſent
ly boil up with very grea
vehemency.

The cauſe is obſcure
yet it is well known, tha
Water it ſelf will diſſolv
Iron: ſo that it appears
as well by this, as by ſom
other Experiments, tha
even in Water, as mild a
it is, there is ſome kind o
corroſive Principle.

Antimony with ſpirit o
Nitre, and Aq. fortis ſeve
rall

rally, maketh an Effervescence ; somewhat lower than Iron. With Oil of Vitriol the Bullition is so small, as difficultly to be perceived with a Glaß.

Hence it seemeth to be of a very compounded nature ; if I may so call it, a subacido-alkalizate Metal.

Crocus Metallor. with spirit of Nitre, makes a very little Effervescence.

Whence the *Metalline Salt* is not wholly lost in the preparation, but only diminished. *Anti-*

Antimonium Diaphoreticum, with Spirit of Nitre and Oil of Vitriol ſeverally, makes a conſiderable Effervеſcence.

Wherefore it is not an uſeleſs *Preparation*; as from the *Calcination* and *Ablution* uſed therein, ſome have thought.

Bezoardicum Minerale, (that upon which I made tryal) ſtirreth not at all either with Alkalies or Acids.

To which, let thoſe who make uſe of it, have regard.

Tin

Tin, with Spirit of Nitre, makes ſo hot and vehement an Effervеſcence, that it turns preſently, as it were, into a Coal. It makes alſo a fair Bullition with Oyl of Vitriol. And a gentle one with Spirit of Salt.

Wherefore it hath ſomething of the nature both of *Iron*, *Lead*, and *Copper*.

The like remarkable circumſtance is ſeen in the mixture of Aq. fortis with Tin, as with Iron. For Tin

and Aqua fortis of themſelves will not ſtir; but add a few drops of Water to them, and they boil up with the greateſt vehemency.

Copper, with Spirit of Salt, and Oyl of Vitriol ſeverally, ſtirs not at all. Spirit of Nitre, and Aqua fortis, both boil it up vehemently.

Neither Spirit of Hartshorn, nor Spirit of Salt Armoniac maketh any Bullition therewith. But both of them, by a gentle ſolu-

tion,

tion, that is, gently ſeparating its Sulphur from its Salts, turn it blue.

Hence *Copper* hath a greater proportion of *acid* than *any* of the forementioned *Metals*.

Silver neither with Spirit of Salt, nor Oyl of Vitriol makes any Bullition. With Spirit of Nitre it makes one, but 'tis ſoon over: and then continues to diſſolve ſlowly into white Coagulations. It alſo maketh with Spirit of Hartshorn, or of Salt Armoniac,

a full and deep blue.

Hence there is a greater proportion of *acid* in *Silver*, than in *Lead*, *Mercury*, *Iron*, *Antimony*, *Tin*, or *Copper*.

Litharge of Silver maketh the greateſt Effervescence with Oyl of Vitriol. Yet ſome with Spirit of Nitre. And with Spirit of Salt Armoniac maketh ſome little huff or elevation. And being mixed with Spirit of Nitre and Spirit of Salt Armoniac both together, produceth a faint blue.

Hence

Hence, although the far greater part of this *Litharge* be but *Lead*; yet it ſeems it hath ſome ſmall mixture of *Silver*. But that of *Gold* ſeemeth, for contrary reaſons, not to have any *Gold*.

Gold maketh no Effervеſcence with any ſingle Salt I know of. But it is commonly diſſolved with Aqua Regis, which is known to be a very alkalizate Liquor.

Whence it ſeemeth, That as *Lead* is the *moſt*

alkalizate, ſo *Gold* the *moſt acid* of *Metals*.

Theſe things conſidered, and other obſervations added hereunto, may poſſibly give ſome directions, not only for the ordering and uſing, but even for the making, imitating and tranſmuting of *Metals*. Thus far of *Metals*.

I will next give one or two Inſtances of tryal upon Sulphurs. And firſt Sulphur vive, with Aq. fortis, maketh an apparent Bullition,

tion, but it is ſome time, before it begins. But the factitious or common Brimſtone, maketh ſcarce any, if any at all.

So that there is no ſmall difference betwixt them.

White and yellow Arſenick make no Bullition either with Alkalies or Acids.

Wherefore the ſtrength of its operation on the Body, lies more in a *Sulphur*, than a *Salt*.

The aſhes either of Pit-Coal, or Sea-Coal, make no

Effervescence with Alkalies or Acids.

Whence the saline Principle is altogether volatile, and sublimed away by the fire.

Lastly for Salts. And first of all, Borax maketh no Effervescence nor any Fumes with Oyl of Vitriol or Spirit of Nitre.

Hence, it is of a very different nature from *Salt Armoniac.*

Oyl of Vitriol and Nitre make fumes or steams, though no Effervescence.

Green

Green Vitriol, with Spirit of Harts-horn, is ſcarcely moved. White Vitriol, with the ſame Spirit, maketh a conſpicuous huff. And Roman Vitriol a vehement Effervеſcence.

Whence the *former* is the *leaſt acid*, and the *latter the moſt of all*. Which alſo confirms what I ſaid before of the like natures of the ſeveral *Metals* to which they belong.

Salt of Vitriol, though a fixed Salt, and made by Calcination, yet maketh no

Effervescence with the strongest acid ; but only with Alkalies ; as may be seen upon their mixture, but much better heard by holding the mixture to ones ear.

Hence, there are *fixed Acids.* Which further confirms what I have above asserted concerning the nature of *Gold*, *scil.* That the *predominant Salt* thereof is a *fixed Acid.*

Sal Martis, with Spirit of Harts-horn, maketh a considerable huff.

Hence

Hence it is much more *acid* than *green Vitriol*; and is therefore a cooler body.

Alum and Sp. of Harts-horn make a plain Effervescence.

Saccharum Saturni, with Oyl of Vitriol, stirs not at all. With Spirit of Salt, huffs a little. With Spirit of Nitre much more.

Hence the *acid* of the *Vinegar*, and not the *Alkaly* of the *Lead*, is the predominant Principle.

Common Salt stirs neither.

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Common Salt stirs neither.

ther with Spirit of Salt, nor with Spirit of Nitre; nor with Aq. fortis. But with Oyl of Vitriol it maketh a great Effervescence with noise and steams.

Hence, even common Salt, though it be not reckoned amongst *alkalizate Salts*, yet is far nearer in nature to *that*, than to an *acid*. Hence also the *Spirit of Salt* is a *subalkalizate Acid*, and of a very different nature from *Oyl of Sulphur* or *Vitriol*.

Salt

Salt Armoniac, with ſpirit of Nitre, ſtirreth not. But with Oyl of Vitriol it maketh a great Effervescence.

Hence *ſpirit* of *Nitre* is a *ſubalkalizate ſpirit.*

Oyl of Vitriol and ſpirit of Nitre, though both acids, yet make a great ſmoak; greater than that which the ſpirit maketh of it ſelf. Which confirms the laſt preceding *Corollary.*

Oyl of Vitriol and ſpirit of Salt, though both acids, yet make a ſtrong Effervescence,

ſcence, with noiſe and fumes.

Which further confirms, what was noted before, *ſcil.* that Spirit of Salt is a *ſubalkalizate Acid.*

Spirit of Salt Armoniac with Oyl of Vitriol, make an Effervеſcence ſo extraordinary quick, and as it were inſtantaneous, that nothing ſeemeth quicker.

Whence it is probable That if *Gun-powder* were made of *Salt Armoniac* inſtead of *Nitre*, or with

both mixed together; it would be *far ſtronger*, than any kind now in uſe. And thus far for *Minerals*.

I have only one *Corollary* to add, from the whole; which is, That whoever doth undertake the *Natural Hiſtory* of a *Country*, (ſuch as that the Learned Dr. *Plot* hath excellently performed of *Oxford-ſhire*) the foregoing *Method*, ſeemeth ſo eaſie, cheap, and indeceitful for the finding out

and

and well diſtinguiſhing the natures of all kinds of *Metals*, *Ores*, *Salts*, *Earths*, *Stones*, or other *ſubterraneal bodies*; as cannot, I think, be ſupply'd but by others of greater difficulty and expence.

CHAP. III.

I Now proceed to the ſeveral *Parts* of *Animals*; as *Hairs*, *Hoofs*, *Horns*, *Shells* and *ſhelly Inſects*,

Inſects, Bones, Fleſh and the ſeveral Viſcera, Silk, Blood, Eggs, Musk, Caſtor, Gall, Urine, Dungs, Salts, and Stones.

And firſt of all, the Hair of a mans head, with Oyl of Vitriol, maketh no Bullition at all. Nor yet with Spirit of Nitre.

So that although it contains a good deal of *volatile Salt*; yet it ſeemeth rather not to be *alkalizate*, or elſe is *centred* in ſo great a quantity of *Oyl*, that the *acid menſtruum* cannot reach it. *Hares*

Hares Furr, with ſpiri
of Nitre, maketh, although
a ſhort, yet very plain Bul
lition and huff.

Hence the *Hair*, an
therefore the *Blood*, c
ſome *Animals*, is fuller o
Salt, at leaſt of an *alkal*
zate Salt, than that o
ſome others. And perha
the *Hair* of ſome men,
of *Blacks*, may be ſo fu
of *Salt*, as to make a Bu
lition like *Hares Furr.*

The ſhavings of Na
ſtir not at all, either wi
Oyl of Vitriol, or ſpirit
Nitr

Nitre: only with the latter hey turn yellow.

Elks Claws, with ſpirit of Nitre, make a ſmall and low Bullition.

Horſes Hoof, with Oyl of Vitriol, ſtirs not of many hours. But with ſpirit of Nitre, allowing it ſome time, makes a very plain Bullition, and huffs up very high.

Cows Horn, neither with Oyl of Vitriol, nor with ſpirit of Nitre, maketh any Bullition, only turneth to a yellow colour.

Rams

Rams Horn ſtirs no
with Oyl of Vitriol ; bu
with ſpirit of Nitre, make
a ſmall and ſlow Bullition

Harts-Horn makes
conſiderable Bullition an
huff, even with Oyl of Vi
triol, which the reſt of th
Bodies above-ſaid, will no
do. But with ſpirit of Ni
tre, it makes yet a greater.

From the foregoin
Experiments, and almoſ
all that follow, what wa
formerly aſſerted of th
Salts of *Vegetables* and
Minerals, is here alſo evi
dent

ent concerning that of *nimals*, *ſcil.* That it is ot *made*, but only *ſepa-ted* by the fire.

It likewiſe hence ap-ears, That the *proportion* f *Salt* in the fore-men-oned *parts* is very dif-rent; and that there-re ſome of them are ne-r, and none of them t with good diſcretion, be ſubſtituted one for other in Medicine.

As alſo, that there is a fferent proportion of lt in the ſeveral *Ani-*

mals

mals themſelves, to which
the ſaid *Parts* belong.

Next for ſhells; as thoſe
of Lobſters, Eggs, Snails
and Oyſters: all which
make an Effervеſcence
both with Oyl of Vitriol
and ſpirit of Nitre. Bone
with ſpirit of Nitre the
greateſt.

Lobſter-ſhells make a con-
ſiderable Bullition and huff,
but no noiſe, nor ſteams.

Egg-ſhells make a Bul-
lition and huff, with ſome
noiſe, but no ſteams.

Snail-ſhells make an Ef-
fervеſcen

fervescence with noise and steams.

Oyster-shells make one with the greatest noise and thickest steams.

Hence we may judge, in what case to administer *Bone* more appositely than *the other*. As also *in what proportion*, according to their different strength. *Some* may be better for *Children*, as being milder. Or for a Body whose very sharp *Blood* or other *Humors*, are very easily kindled into *Ferments*.

Or

Or elſe may be ſafeſt, to avoid a ſudden *precipitation* of the *Humors*; or for ſome other cauſe.

Oyſter-ſhells, and the reſt above-ſaid, make a quicker Effervescence, not only with ſpirit of Nitre, but even with ſpirit of Salt, than they do with Oyl of Sulphur, or Oyl of Vitriol.

So that *theſe Bodies*, as well as *Metals*, have their proper *Menſtruums* whereby they are beſt diſſolved.

Egg-ſhells calcined, make with

with Oyl of Sulphur, or Oyl of Vitriol, or ſpirit of Nitre, a greater Effervescence, than when uncalcined. As alſo with ſteams; which uncalcined, they produce not.

The like is ſeen in calcined Oyſter-ſhells.

The longer the Calcination is continued, the quicker and ſtronger will be the Effervescence. This I tryed at ſeveral terms, from a quarter of an hour, to five hours. So that after ſo long a Calcination, they

make an Effervescence almost instantaneous.

The reason hereof is, Because the *Sulphur*, being for the greatest part driven away by the fire; the remaining *Salt* lies now more open and naked to the attaque of the *Menstruum*, so soon as ever they are mixed together.

From hence it is plain That *Egg-shells*, and the others above-said, being *burnt*, are far *stronger* Medicines, than when *unburnt*.

It is hereby likewiſe evident, That a great portion of their *Salt*, is not a *volatile*, but a *fixed Alkaly*.

To theſe may be ſubjoyned all kinds of ſhelly Inſects. I will inſtance in three or four.

And firſt Bees, with Oyl of Vitriol, ſtir not in the leaſt. With ſpirit of Nitre they make an exceeding ſmall Bullition, without any elevation.

Cochinele makes ſome Bullition with Oyl of Vi-

triol, but very ſmall: for the bubbles are not to be ſeen without a Glaſs. But with ſpirit of Nitre the Bullition is more viſible, and joyned with ſome elevation.

Cantharides make no viſible Bullition with Oyl of Vitriol. But with ſpirit of Nitre they do, and buſ up rather more than Cochi nele. Yet is this done ver ſlowly, and comparativel with many other bodies, i not much.

Hence it is not th

quan

quantity, but the *quality* of their *volatile Salt*, which makes them ſo ſtrong an *Epiſpaſtick*. For moſt of thoſe bodies above, and hereafter named, make a greater *Bullition*, and yet are neither *Cauſtick* nor *Epiſpaſtick* in the leaſt.

It is hence alſo evident, as hath been before ſuggeſted, That there are divers kinds of *volatile Salts*, eminently different; ſome being highly *alkalizate*, others very

ry *little*, and ſome ſcarce any thing ſo : ſuch as thoſe of *Scurvygraſs*, *Anemone*, *Crowfoot*, and many the like *Plants* ; to whoſe *Salts*, this of *Cantharides* ſeemeth to be very near of kin.

Millepedes make a Bullition and huff, much greater and quicker, than any of the Inſects above-named : and that both with ſpirit of Nitre, and Oyl of Vitriol it ſelf. Yet is this Inſect of a very temperate natnre.

Where-

Whereby is further demonſtrated, That the being *ſimply alkalizate*, is not enough to make a body to be *Cauſtick*.

Again, although Millepedes make a Bullition, greater than any of the Inſects above-named: yet is it much leſs, than that of Oyſter, Snail, or even Egg-ſhells; and of divers other bodies above, and hereafter mentioned.

Hence, being given to the ſame intent, as any of thoſe bodies; it is the

mildeſt and gentleſt in its operation of them all.

Millepedes likewiſe calcined, make a ſtronger Effervescence, than when uncalcined, as do Oyſter-ſhells, &c.

So that it appears, That *all Teſtaceous Salts*, are, at leaſt in part, *fixed Salts.*

I next proceed to Bones. And firſt Whale-bone maketh no Bullition at all with any acid.

A Cartilage, with ſpirit of Nitre, makes ſome very ſmall bubbles, not to be

ſeen

ſeen without a Glaſs.

The Bone in the Throat of a Carp, makes a little and ſlow Bullition with ſpirit of Nitre.

The Spina of a Fiſh (that which I uſed was of a Cod-fiſh) maketh a Bullition one degree higher.

All ſorts of Teeth, as of Dogs, Boars, the Sea-Horſe, Elephant, make the like. As alſo the Bone of an Oxes heart.

So that all theſe are very gentle in their operation, and fit for *Children.*

Sheeps and Calves Bones both of them make a Bullition yet a little higher, especially with ſpirit of Nitre.

Cocks Bones ſomewhat higher than the former.

Cranium humanum a little higher than all the reſt.

Bones likewiſe, being calcined, make a Bullition with Acids. And ſo doth alſo calcined Harts-horn. But in neither of them, is the Bullition advanced by Calcination, any thing com-

parabl

parable to what it is in ſhells.

Whence it appears, That the *Salt* of *Horns* and *Bones*, is much more *volatile*, than that of *Shells*.

Next for Fleſh and the ſeveral Viſcera. And firſt, dryed and powdered Mutton, with Oyl of Vitriol, ſtirs not at all. But with ſpirit of Nitre makes a ſmall Bullition and huff.

Sheeps Heart doth the like ſomewhat more apparently.

Vipers fleſh produceth a froth,

froth, but huffs not.

Powdered Earth worms make a great froth, and huff a little.

Powdered Tripe makes only a little Bullition.

Lamb-ſtones do the like.

Kidney, Spleen, and Liver, with ſome elevation.

Lungs, with bubbles very large; becauſe extraordinary ſlowly.

Dryed Brain makes alſo a little and ſlow Bullition.

Hence, there is a greater proportion of *Sulphur*

or *Oyl*, and leſs of *an Alkaly in all theſe parts*, than there is in *Bones*, *Shells*, and divers other *parts* hereafter mentioned. And in ſome of them, as in the *Brain*, that *Salt* which there is, may rather be lodged in ſome *ſanguineous* parts mixed with them, than in their own proper ſubſtance.

I proceed to inſtance in all ſorts of Animal *Contents*.

And firſt, *raw Silk*, *with ſpirit of Nitre*, *makes*

a very ſmall Bullition, but the elevation is conſiderable.

The grumous part of the Blood dryed, with Oyl of Vitriol, ſtirs but little. But with ſpirit of Nitre it huffs up conſiderably.

Serum of Blood dryed, with the ſame ſpirit, makes a plain elevation, with a little Bullition.

Herewith may be reckoned the White of an Egg which is nothing but a pure Cryſtalline Serum ſeparated from the common ſtock

Thi

This being dryed, with ſpirit of Nitre, huffs up rather more than even the grumous part of the Blood, the bubbles are much larger, break oftner, and the elevation ſooner made.

Whence it ſeemeth, that there is a greater quantity of a *volatile Alkaly* in proportion to the *Sulphur*, requiſite to the *Generation*, than to the *Nutrition* of an Animal.

The Yolk of an Egg is ſcarce moved with ſpirit of Nitre, producing only a very

ry few Bubbles. The *Salt* being either little *alkalizate*, or elſe *immerſed* in ſo great a quantity of *Oyl*, that the *Menſtruum* cannot reach it.

For the ſame reaſon Sperma Ceti ſtirs not with any Acid. Neither doth Civet.

Ruſſian Caſtor, with Oyl of Vitriol, ſtirs not. But with ſpirit of Nitre makes a conſiderable huff and froth. Yet it requires time.

Wherefore it ſeemeth, That *Caſtor* by virtue of its

its *alkalizate Sulphur*, becomes ſo good a *Corrector* of the *acido-alkalizate Sulphur* of *Opium*: ſo I take leave to call it, having ſome reaſons to believe it ſuch.

Musk, with Oyl of Vitriol, ſtirs not. But with ſpirit of Nitre it makes a conſiderable and quick Bullition, with large bubbles, which often break and riſe again.

Whence there is a very eminent difference betwixt *Musk* and *Civet*.

Hence

Hence alſo, *Musk* is Cordial, not only from its *Sulphur*, but its *Alkaly*; by both directly oppoſite to preternatural *Acidities*.

Dryed Gall with ſpirit of Nitre for ſome time is ſtill: but at length it makes a conſiderable Bullition and froth.

The reaſon why it is ſo long before it begins, is becauſe the *Salt*, (as was obſerved of ſome other *Parts*) is *locked* up in ſo great a quantity of

Oyl.

Oyl. The abundance whereof is manifeſt, not only from *Deſtillation*, but alſo from hence, In that the dryed *Powder*, in lying by, incorporateth all together into one body, as *Mirrh*, and ſome other ſofter and oily *Gums* are uſed to do.

Extract of Urine, with ſpirit of Nitre, makes a Bullition with ſome Effervescence, which continues for a conſiderable time; and at laſt it huffs up with great bubbles. The Bulli-

tion

tion begins preſently: the Salt being copious, and the Oyl but little.

The ſame Extract of Urine makes a conſiderable bullition and froth, not only with ſpirit of Nitre, but even with Oyl of Vitriol.

Hence the *Salt* of *Urine* is more *alkalizate* than that in moſt of the afore-ſaid *Contents*.

From this and ſome of the following *Experiments*, it alſo appears, That the *Salt* which con-

curs

curs to the generation or conſtitution of *Gravel* or of a *Stone* in the *Kidneys* or *Bladder*; is of a very different nature from the *Salt* of *Urine*.

Next for Dungs. And firſt, dryed Goats-dung makes, with ſpirit of Nitre, a ſmall bullition, but no elevation. That of Mice the like. And that of Cows. So that of all I have tryed, theſe three ſtir the leaſt.

Gooſe-dung, with ſpirit of Nitre, makes a very ſmall bullition and ſome elevа-

elevation. But it requires time. Oyl of Vitriol ſtirs it not.

Album Græcum, with ſpirit of Nitre, beſides innumerable ſmall bubbles, riſes up with ſome great ones, exactly reſembling the huffing up of Yeſt or Barm. Alſo with Oyl of Vitriol it maketh ſome little froth, but ſlowly.

So that it ſhould ſeem, that the *Bones* are a little *opened* by ſome *acid Menſtruum* in the Dogs ſtomach (as the body of *Steel*

is in its preparation with *Sulphur*) whereby it becomes a good mild *Topick* in *Quinzies*.

Hens dung, with ſpirit of Nitre, makes a very great bullition and huff: greater and quicker, than any of the reſt above-named.

But of all I have tryed, Pigeons dung, with the ſame Spirit, maketh the greateſt and the quickeſt Effervеſcence and huff; and that not without ſteams. Yet neither the ſame

Dung,

Dung, nor that of Hens, is moved in the leaſt with Oyl of Vitriol.

The cauſe of ſo great an *Effervеſcence* in theſe, more than in the reſt, is that *white part* which is here mixed in a great quantity with the *Dung*. Which *white part*, deſcendeth not from the *Stomach*, but is an *Excrement* ſeparated from the *Blood* (as are *Gall* and the *Succus Pancreaticus*) by a peculiar *Organ*, which evacuates it into the *Inteſtinum*

tinum rectum; whence, together with the *Stercus*, it is excluded.

Hence it is evident, That in the ſaid *white part* of *Hen's*, and eſpecially *Pigeons dung*, is contained a great quantity of *volatile Alkaly*.

I proceed to Salts. And firſt Salt of Blood and Urine both make a more durable Effervescence with Acids, than doth Salt of Wormwood, or Salt of Fern.

Hence the former are more *alkalizate*, than the latter.

Again, though divers other Animal Salts will not ſtir with Spirit of Salt, or with Oyl of Sulphur or Vitriol; yet the Salt of Blood will make an Effervescence with all kinds of Acids.

Whence it is further argued to be highly *alkalizate*, and very proper for the *correction* of all ſorts of *preternatural Acids*

cids in the body. There is little doubt, but that *Spirit* of *Harts-horn* will do the like.

The Tartar or Gravel which precipitates out of Urine, with Oyl of Vitriol, makes no bullition in the leaſt. Nor with ſtrong ſpirit of Salt. But with ſpirit of Nitre, it makes a very great one, with Effervеſcence and ſteams.

From hence it appears, That there is much difference to be made in the

uſe of *acid Diureticks*, *Nephriticks*, &c.

And that I may not altogether omit to mention, what may be ſo much for the good of mankind, I do here declare, That for preventing the generation of the *Stone*, either in the *Kidneys*, or in the *Bladder*, there are not better *Medicines* in the world, than ſome certain *Preparations* of *Nitre*, duly adminiſtred. Who-ever ſhall think

think that any kind of *acid*, as *Oyl of Sulphur*, *Oyl of Vitriol*, *Spirit of Salt*, or the like, will have the ſame effects, will find themſelves much deceived in their practice.

I conclude with Stones. And firſt, Spirit of Nitre dropped upon a Stone of the Kidneys or Bladder produceth the very ſame effect, as upon the Gravel in Urine. That is to ſay, it makes it boil and huff up, until at length it is

perfectly dissolved into a soft Pulp; which neither Oyl of Sulphur, nor Oyl of Vitriol, nor Spirit of Salt will do; nor give the least touch towards its dissolution.

This confirms what I said before of the use of *Nitre* and *Nitrous Spirits*, if duly prepared and administred, above any other *Acids*, against the *Stone*.

Pearls, with any Acid, make the like Effervescence

ſcence, as do Oyſter-ſhells.

Magiſtery of Pearls, as uſually prepared, ſtirs not at all, with any Alkaly or Acid.

So that as to the effect frequently intended by it, it is very inſignificant; as of that of *Corals* hath been ſaid.

Crabs Eyes, with any Acid, make an Effervescence, almoſt as quick as that of Oyſter-ſhells.

Crabs Eyes likewiſe calcined, make a ſtronger Ef-

ferveſcence, than when uncalcined.

So that *theſe*, as well as *Shells*, contain a *fixed Alkaly.*

The ſtones in Whitings heads make a ſtrong Effervеſcence like that of Oyſter-ſhells.

Stone of humane Gall, ſtirs not with Oyl of Vitriol. But with ſpirit of Nitre maketh a little bullition juſt upon mixing, and after a conſiderable time, a little froth. Much leſs than

what

what was obſerved before of the Gall it ſelf.

So that it ſeemeth to be generated of the *Gall coagulated* by ſome *Acid*, which hath already *refracted* the *Alkaly* wherewith the *Gall* abounds.

This confirms the uſe of thoſe *Medicines* in the *Jaundies*, or any other bordering *Diſeaſe*, which deſtroys thoſe *Acidities* by which the *Gall* is *curdled* or *coagulated*, and ſo rendred more difficultly

ſeparable into the *Guts*.

Bezoar, neither the Weſtern, nor the Eaſtern, doth ſtir at all with Oyl of Vitriol.

Weſtern Bezoar, with ſpirit of Nitre, makes a very little thin froth, and that's all; and that it doth very ſlowly.

But Oriental Bezoar, with ſpirit of Nitre, after ſome time, maketh a very great Effervеſcence, with froth, elevation, noiſe, and ſteams. (as if you poured

Oyl

Oyl of Vitriol upon Salt of Tartar) *till it be wholly diſſolved by the affuſed Spirit, and turned into almoſt a blood-red.*

Hence it may ſeem to be no mean *Remedy* againſt ſuch *fretting* and *venenate Acids*, as oftentimes in *Feavers*, and other *Diſtempers*, lye about the *Stomach*, and are thence frequently tranſlated to the *Heart*, *Brain*, *Nerves*, and other *parts*.

The difference likewiſe

wiſe betwixt the *Weſtern*, and the *Eaſtern Bezoar*, is ſo great, that in any caſe of danger, and where the *Bezoar* is relyed upon, it is an unpardonable fault, for the *Apothecary*, or any *Perſon*, to *ſubſtitute* the one for the other: unleſs he will take *ten times* as much, or *ten times* as little of the one, as he would have done of the other: if that will ſerve turn.

The Stones already mentio-

mentioned, are ordinarily generated in the bodies of Animals. I have one inſtance more of ſome other Stones which are extraordinary. In the City of *Hereford* lives a Maid, who often voids theſe ſtones, and in the ſpace of ſome years laſt paſt, hath voided ſeveral pounds, of ſeveral colours, and ſizes, not only *per vias urinarias*, but alſo by vomit, and by ſtool. The firſt mention made

to

to me of them, was by Mr *Digges*, a worthy Gentleman of that City, as a thing that was there much wondred at. And ſome of them, upon my deſire, were ſent me by Mr. *Wellington*, a noted Apothecary in the ſame place. *I have tryed what ſeveral acid Menſtruum will work upon them; and find, That with Oyl of Vitriol, and eſpecially with Spirit of Nitre the greater ones make a very quick and conſp*

conſpicuous Effervescence. But the ſmall ones, neither the white, nor the grey, make any bullition in the leaſt: for in truth, they are no other but little Pebble and greet Stones.

This being conſidered, and the various *colours* and *mixture* of any one of the great *Stones*, being well obſerved; it ſeemeth plain, That although ſhe be ſomewhat old (above thirty years) yet may ſhe have a kind of

μελανία,

μαλαξια, or *diſeaſed Appetite* to *Stones*, *Bones*, *Wood-aſhes*, *Tabaco-pipes*, *Chalk*, and ſuch like things; which ſometimes ſwallowing in little *lumps*, ſometimes groſly, or finely *ground* betwixt her teeth; they are in her *Stomach* and *Bowels*, more or fewer of them, *cemented* together, either with a *pituitous*, *bilious*, or ſome other more or leſs *glutinous ſubſtance*. And that by virtue alſo of the

ſaid

ſaid *Cement*, or any of the ſaid, or other like *alkalizate Bodies*, the greater *Stones*, which conſiſt of thoſe partly, do make an *Effervescence* with *acid Liquors*. Thus far of *Inſtances* upon the *parts* of *Animals*. I ſhall cloſe with ſome *Corollaries* deduced from the whole.

And firſt, ſince we find, that amongſt all the *Menſtruums* we have made uſe of, *Spirit* of *Nitre*, or any very *Nitrous Spirit*,

Spirit, is the moſt *univerſal diſſolver* of all kinds of *Animal bodies*; the *beſt diſſolver* of many others both *Vegetable* and *Mineral*, and the *only diſſolver* of ſome: Hence it is probable, That the great *ſtomachick Menſtruum*, which either *diſſolves*, or *opens* almoſt all *Bodies* which come into the *Stomach*, is a kind of *Nitrous Spirit*.

Again, *Spirit* of *Nitr* being a *ſubalkalizate A* *cid*

cid, and working more evidently upon *Animal bodies*, than other *ſimpler Acids* do, which yet are as *ſtrong*; It hence follows, That moſt of the *Salts* of *Animals* are *ſub-acid Alkalies*. How far this *concluſion* may further inſtruct us, I ſhall have occaſion to ſhew in another *Diſcourſe*.

Laſtly, there being ſo many, ſay twenty or thirty *degrees*, from the *ſloweſt* to the moſt *vehement*, in

in the *Bullition* of *mixed Bodies*; it ſeemeth, That *Fermentation* it ſelf, as to the *formal notion* of it, is nothing elſe: or that from the common *Luctation* of *mixed Bodies* whereof we have now bin ſpeaking, it differs not *in ſpecie*, but only in the manner of its *cauſation*, and in *degree*: the *Aer*, or ſome certain *Menſtruum* lodged therein, being of no greater *ſtrength*, than to produce

a

a *Bullition* or *Luctation* of that *low* and *ſoft degree*, which we call *Fermentation*.

I have thus endeavoured to prove, by various *Inſtances*, how inſtructive this moſt eaſie, plain and ſimple *Method* in the *Mixture* of bodies, may become to us: & that meerly by obſerving the *Luctations* which thence ariſe betwixt them. How much more then, if a diligent remarque be made of all thoſe

thoſe various *Colours*, *Smells*, *Taſtes*, *Conſiſtencies*, and other *Mutations* thereupon emergent ?

FINIS.

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